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ABSTRACT

Language teachers with little or no experience in conducting research are guided through the process of deciding what kind of classroom research to undertake, and how to organize and implement it. In question-and-answer format, four types of research are defined and explained separately: action, survey, correlational, and experimental studies. For each, an answer is provided to the questions: What is it? When do I do it? How do I set it up? How do I analyze the results? and Where do I go from here? Discussion addresses the characteristics, intended use, appropriate context, advantages and disadvantages, organization, type of data obtained, interpretation of results, and adjustments that can be made in the design. (Contains 13 references.) (MSE)

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Chapter 6

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Methods for the "Research Challenged"

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Research, simply put, is the gathering of information (data) that will help to answer a question about the world around us. It can be broken down into two categories, secondary and primary. Primary research "is derived from primary sources of information (e.g., a group of students who are learning a language), rather than from secondary sources (e.g., books about students who are learning a language)" (Brown, 1988, p. 1). Research also "involves planned and systematic inquiry" (Seliger & Shohamy, 1989, p. 12), which differentiates it from common sense.

This is the same explanation we see in all the research manuals, and it is not what most *teachers* want to hear. Many language teachers have an ingrained fear of the very concept of research. They may say, "Research is for people with PhDs in the field. I just want to teach my courses." Others may say, "Research requires statistics, and I don't want to have anything to do with statistics."

However, research, whether we are willing to acknowledge it or not, is present in all facets of our teaching experience. How many times have you tried a new way of teaching vocabulary? How did you evaluate the efficacy of the technique? Did you compare test scores? Did you ask a few questions of the

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students to see how they liked it? Did you overhear some students' remarks while they were doing the lesson? Did you look at their faces and notice that their eyes were lighting up with discovery—or clouding over with confusion? If you have done any of the above, you have started down the road toward doing research. Of course, you did not formalize your hypotheses, write up a proposal, and submit it for publication, but you did a form of research all the same.

Have you ever had to teach a pronunciation class and wondered which sounds to teach the students? Well, in order to find out, you probably did a kind of needs analysis. In other words, you may have interviewed some of the students to get a general feel for what types of sounds give them major difficulties. You may have given them a quiz in which they were to mark the correct answer to a question about how to make a particular sound. You may have given them a listening test in which they were to determine which word in a minimal pair was spoken. Or, you may simply have paid careful attention to their pronunciation while doing another lesson. No matter how you went about it, the fact is, the needs analysis you did is a form of research.

What we intend to do in this paper is to take some of the mystery out of the word "research" by showing you some ways you can carry it out without radically changing what you normally do. In other words, you can do a lot of useful and interesting studies without ever leaving your classroom.

Our goal is that this paper will help you to realize that research is something you *can* do, because you have been on the brink of doing it all along. The paper is divided into sections, with each covering a particular methodology. The sections will address the questions: What is it? When do I do it? How do I set it up? How do I analyze the results? And, where do I go from here?

Action Research

What is it?

Action research (AR) could be described as classroom research on a shoestring. It is a kind of research that is accessible to every teacher. Simply put, to do action research all you need is a classroom, a problem, and an idea or two on how to solve the problem. As a good teacher that is exactly what you do every day. But what sets AR apart is that it is done in a more systematic manner. Action research formalizes what we do unconsciously every time we step into the classroom.

When do I do it?

Let us say that you are having trouble with a class; the students are not responding to your well-prepared lessons, and you know the lessons are good because all your other classes are doing well. Or, a colleague tells you about a new way of teaching an old lesson, and you decide to try it. Or you are using a new textbook this year, one that you had no say in choosing. Is the book any good?

And how can you make it better? These are some of the more obvious times when action research can be a useful tool.

Whereas many types of research—most notably experimental research with all of its statistical analyses—are usually carried out by experts, action research is essentially the teacher's ball game. In cooperation with other teachers and with students—and even with full-time researchers—a problem is identified and worked on. From this perspective, the best time to do AR is any time. That is what makes this type of research so attractive to the classroom teacher. Talk to your colleagues, decide what to teach, try it, evaluate it, revise it, try it again, evaluate it again: Hey, you have just done your first action research study.

We would like to point out the usefulness of a video camera. Even though it is troublesome to bring a camera into the classroom, set it up, and get usable video footage, the positives definitely outweigh the negatives. You do not have to watch the tape and transcribe all the utterances and actions; simply look at it. You will discover a lot of interesting things you never thought of, because you will be looking at it from a different perspective. It is also easier to consult with your colleagues, because you can show them the relevant parts of the lesson as they happened, as opposed to trying to explain how things went.

How do I set it up?

One aspect of AR that is often ignored is the need for collaboration. It cannot happen when teachers jealously guard their secrets for fear that they will be stolen. Get together with your fellow teachers, outline your problem, brainstorm some solutions, choose the most likely one, and plan your study.

Once you have identified your problem and potential solution, it is time to conduct your research. As a guideline for what you should look for when observing your students, Knowles (1990, pp. 7-10) offers the following questions:

- What did the students actually do?
- What were they learning?
- How worthwhile was it?
- What did I do?
- What did I learn?
- What do I intend to do now?
- What would I recommend to my colleagues?

In essence, these questions replace the formal hypotheses and research questions found in experimental research. However, that does not mean that action research can be sloppy. Thinking about these questions combined with careful observation of what happens in your classroom is essential for carrying out a successful AR study. So, do not just pass over these questions when you do some AR—write them down along with the answers. It is just like the essay outlines you have your students write—not much fun, but really useful.

How do I analyze the results?
As with other aspects of action research, evaluation is also quite informal. Observe what happens during the lesson, share your observations with your colleagues, and discuss how effective your solution was and how to refine it. If the problem has disappeared, great! If not, go back to the drawing board, and consider other possible solutions.

Where do I go from here?
Action research is a great starting point for teachers who are allergic to research. It does not take a lot of resources or extra time, just a little forethought and collaboration with your fellow teachers. So, read the other papers in this volume, talk to your colleagues, observe your classes, and you will be on your way. And if you get bitten by the research bug, read on to find out how to dive into the ocean of hard research head first.

Survey Research

What is it?
A second type of research that teachers often do unconsciously is survey research. Have you ever asked students for their opinions about a lesson? Have you asked them what they feel they need to study, what their weak points are, or what they want to discuss next week? If so, you have done survey research. Many teachers may not consider it so, but if research is the gathering of data to answer specific questions, then surveys certainly fit the bill.

Survey studies "focus on a group's attitudes, opinions, and/or characteristics" (Brown, 1988, p. 3) and are often exploratory in nature. The researcher's aim is to gather as much information as possible on a question rather than to confirm an answer. There are two basic types of survey research. The first is the use of questionnaires, which are especially useful in gathering data from a large number of people. The second type of survey is the interview, which is very useful in gathering detailed information from a smaller number of subjects. It is often used as a follow up to a questionnaire, but can also stand on its own.

The best way to decide if a survey study is right for you is to look at what you want to achieve; examine all the parameters, such as who you want to gather information from and how easily you want to be able to analyze the data once it is collected.

When do I do it?
Survey research is especially useful in collecting descriptive data. Suppose you want to collect data on the needs of your students, their opinions on some aspect of the lessons or class, ideas for future lessons, personal information, or anything of interest to you that may not be easy to derive from a test—then surveys are a likely candidate.

Questionnaires can be useful when you need to collect information from the students in your classes. As an example, consider a curriculum revision project undertaken at a vocational school. As part of the overall curriculum revision project, a needs analysis was developed in the form of a questionnaire, both for the students and for their future employers. The information from the questionnaire was then used to begin revising the curriculum. Once again, the information collected did not directly reveal the best curriculum but did provide much useful data for making informed decisions.

On the downside, if you do not have a captive audience (like an EFL class) the response rate may be low. If the percentage of people who respond is too low, the value of the study will be called into question. For instance, imagine that you send a class evaluation questionnaire to your students after the class has finished for the year—after all, you do not want the students to think that their responses are going to influence their final grades. After a month, you look at the responses that you received, and find out that 94% of the respondents thought your class was great, 94% said your teaching style was wonderful, and 94% believed your textbook was perfect. Then you notice that out of 150 students, only 17 responded, and 16 (or 94%) of those 17 were A students. Well, most likely you already know that the A students liked you. What you need to know is why the B, C, D, or F students did not respond to your lessons. An interview may be useful here because it allows you to focus on specific information. The one student who did not agree with the majority might be able to provide more valuable information than the other 16 students did. As such, it would behoove you to follow up the questionnaire with an interview, either by telephone or in person, with the student who may not have liked you, might not have gotten much out of the textbook, or could have benefited from a different style of teaching.

How do I set it up?

Setting up a survey is both easy and difficult. It is easy if you think that all you have to do is write up a bunch of questions, copy them, give them to your subjects, collect the papers, and read them. However, you need to consider the following: What information do you want to gather? How structured do you want it? Do you want open-ended questions so the subjects can write their answers freely, or do you want to limit the range of responses to make analysis easier? It is the actual writing of the questions that makes survey research difficult.

In this vein, Ary, Jacobs, and Razavieh, (1990, p. 422–424) have offered the following guidelines to help construct an effective questionnaire:

- Construct the instrument in such a way that it reflects quality. [The questionnaire should be carefully written, proofread, and laid out in order to ensure a high response rate.]
- Keep the questionnaire as brief as possible, so that it requires a minimum of the respondents' time.

- Make sure that the respondents have the information necessary to answer the questions.
- Phrase questionnaire items so that they can be understood by every respondent.
- Keep individual questionnaire items as short and simple as possible.
- Phrase questionnaire items so as to elicit unambiguous answers.
- Phrase questionnaire items so as to avoid bias that might predetermine a respondent's answer.
- Avoid questionnaire items that might mislead because of unstated assumptions.
- Make sure that the alternatives to each questionnaire item are exhaustive, that is, express all the possible alternatives on the issue.
- Avoid questions that might elicit reactions of embarrassment, suspicion, or hostility in the respondent.
- Avoid "double-barreled" questions that attempt to ask two questions in one.

To illustrate what this all means, consider the following examples of good and bad questionnaire items (Nunan, 1992, p. 143–144):

- Good: What do you think about the proposal that foreign languages should be compulsory in high school?
- Bad: Do you think that the concept of learner centeredness is utopian and unrealistic? [This is a leading question which attempts to predetermine the respondent's answer.]
- Good: Rank the following from 1 to 4 in order of preference. "I like to learn best by studying":
  with the whole class
  in small groups
  in pairs
  independently
- Bad: Would you prefer a short, non-award course (3, 4, or 5 sessions) with part-day release (e.g., Wednesday afternoons) and one evening per week attendance with financial reimbursement for travel, or a longer, non-award course (6, 7, or 8 sessions) with full-day release, or the whole course designed on part-time release without evening attendance? [Besides being extremely complex and confusing, this question attempts to gather information on more than one topic.]

Types of questions include open-ended (completion or fill-in questions where respondents write their answers freely), fixed choice (similar to multiple-choice test items), checklists ("Check all that apply"), ranking ("Rank the following from 1 to 5"), or scaled items ("On a scale of one to a hundred, how would you rate your teacher's choice of necktie?").

The scaled items are often written in the form of a Likert scale. Everyone who reads a popular magazine has probably run into this type of scale. For example:

How do you feel when a dentist is looking at you with drill in hand and gleam in eye?

1	2	3	4	5
uncomfortable				ecstatic

Likert scales are especially useful when you need information on the opinions or attitudes of the respondents on issues that can be dichotomized, that is, separated into two opposite attitudes. Some of the common dichotomies found in language research are very serious/slight, important/unimportant, like/dislike, and agree/disagree (Brown, ms), not to mention the ever-popular uncomfortable/ecstatic distinction, as illustrated above.

How do I analyze the results?

Survey data, in general, will result in descriptive analyses rather than statistical analysis. If your questions are open-ended, you could theoretically end up with an infinite number of different responses—assuming, of course, that you had an infinite number of subjects who responded. You would then use these responses to tease out any patterns of interest for further investigation, such as interviews for more detailed data or an experimental study. Fixed choice and Likert scale questions, on the other hand, would most likely be analyzed as percentages, as in this example:

Does your teacher arrive in the classroom on time?

1 – 75%	2 – 22%	3 – 3%	4 – 0%	5 – 0%
almost never				almost always

Again, one of the purposes in calculating the percentages is to discern patterns which merit further investigation. In our example, it would certainly be expedient to the researcher—or at the very least, the department chair—to investigate the situation with the late teacher.

Although this is the most common use for the data from a survey study, it is also possible to construct questionnaires or structure interviews to investigate the relationship between different variables, such as the teacher being late and the students' overall liking of the teacher. In the example, the students responded that they liked the teacher very much, most likely because their lesson was first period and they knew they could get away with being 30 minutes late for class!

Where do I go from here?

We suggest that you take a look at your courses and ask yourself if the students seem to like or dislike a certain aspect, for example a reading or a video that you use. Construct a questionnaire and evaluate the data. You may find that they rate it highly, in which case you would want to introduce more of the

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same. Or, you may find that they rate it very poorly, and then you have to decide if the benefits of the material or activity offset the negative impressions of the students. At least you will have some sort of a starting point to work from.

Correlational Research

What is it?

According to Brown (1988), correlational studies "are designed to investigate the nature and strengths of functional relationships among the variables of interest to the researcher" (p. 126). Another definition was offered by Hatch and Farhady (1982, p. 192): "In correlational studies, researchers are interested in determining the degree of relationship between pairs of two or more variables. . . . In other words, correlational studies allow us to determine the extent to which scores on one test are associated with scores on another test." Correlational studies are pretty easy to comprehend, but the calculation of the "correlation coefficient" may give some people, including us, fits. Just keep in mind, though, that the calculations are the reason we pay big bucks for computers—and even bigger bucks to someone to run them for us.

Basically, what you want to do is see if two scores or measurements are related to each other and how strong the relationship is. For example, one may compare the scores of a vocabulary test with those of a spelling test to see if they are related. The characteristics, in this case vocabulary ability and spelling ability (as measured by the scores on the two tests), are well defined, and the scores certainly vary from student to student. Once the strength of the relationship is established, one could make predictions based on that particular relationship. It should be noted, however, that this is only a prediction and is not to be taken as something chiseled in stone. The problem with correlational studies is that they may not take unknown variables into account, or the variables may not be as well-defined as we imagine. Also, it bears remembering that a very strong correlation does not mean anything more than that there is a strong relationship—causation is not established through a correlational study.

When do I do it?

A correlational study can be set up almost any time, as long as you have two or more variables that you wish to investigate. In order to keep it simple, we will just discuss studies in which two variables are compared, but the idea is the same for more than two. Most commonly, you will be comparing your students' scores on different tests, such as an in-house proficiency test and the TOEFL. Some questions that might be answered by a correlational study are the folowing:

- To what degree does short-term memory relate to language proficiency?
- How well do the ratings on compositions by two different judges match?

- Do students who use more English during classroom activities score higher on the end-of-term test?

Note that in correlational research you are dealing with variables that exist more or less naturally, not ones that you manipulate. When you start manipulating variables, such as using pairwork with one class and TPR with another, you are moving into the realm of the experimental. Let us save that discussion for a bit later.

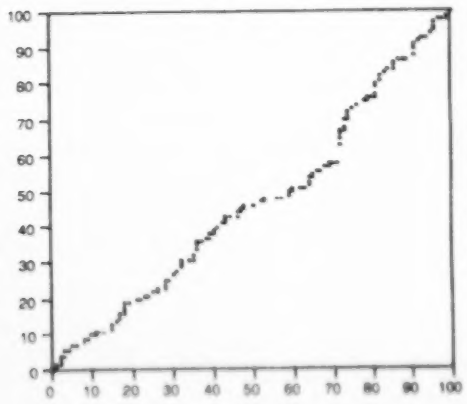
How do I set it up?

First, get a bunch of scores on one test. Then, get a bunch of scores on another test. Then, run the scores through a computer! Let us say that one day you notice that some of the students in your three-hour class seem more active after the mid-class break. You do some action research (or spying, as it is sometimes called) and observe the students during the break. You discover that half of them are going down to the local beer machine to have some refreshments before coming back up to class. So you ask yourself if there may not be some kind of relationship between drinking beer and participation. (See Guiora et al., 1972 and Guiora et al., 1980 for the effects of alcohol and other chemical substances on second language pronunciation ability.)

Next, you need to collect data. In our hypothetical example this would entail getting a "beer score" of how much the students are drinking and a "participation improvement score" showing how much more the students participate during the second half of the class.

How do I analyze the results?

Once you get all the data together, you have two ways of looking at it: visually and statistically. If you just want to get a rough idea of what your relationship looks like, do it visually. Make a simple graph with the X-axis being the scores for one of the variables (e.g., the beer score), going from lowest to highest, left to right. The Y-axis would be the other variable (participation improvement score), once again going from lowest to highest, bottom to top. The results may look something like the graph on the left.



According to this graph, there is some kind of pattern which has developed. There is a fairly strong relationship between the two scores.

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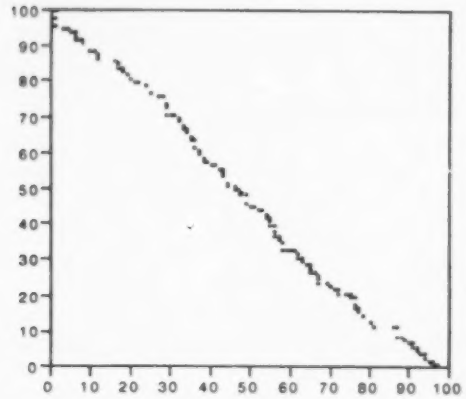
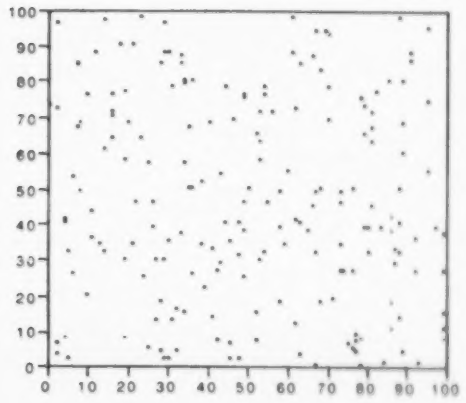
The left to right upward angle indicates that there is a *positive* degree of relationship here, and though the dots do not form a perfect line, it is pretty close. This means that, on the whole, the students who drank beer during the break actually did participate more during the second half of the lesson. But remember, that does not show that the beer caused the increased participation.

Let us assume, however, that the following graph resulted when the data were mapped out:



This graph also shows a fairly straight line pattern, but going from top to bottom. That shows a *negative* correlation, or an inverse relationship. In other words, as the drinking of beer goes up, the number of times a person has participated voluntarily has gone down in comparison to the participation for the non-beer drinkers in class. This means that one could predict that the more one drinks beer during the break, the less one would speak. Again, however, that does not prove that the beer was the cause of the decreased participation.

Now take a look at the graph in this figure:



That is a random plot reflected in that graph! There is no pattern at all. There is little or no relationship between the two variables. In other words, those who drank beer may have participated as much as, more, or less than those who did not. Therefore, it is very difficult to reach any conclusion about the relationship between beer drinking and classroom participation.

Calculating a correlation coefficient is slightly more complicated than using the eye-ball method, but it is much more en-

lightening as it can give you information on the strength of the relationship. If you are using a computer, just choose "correlation" from the menu and you are done. But because working with the statistical calculations is more complex, we do not have the space, time, wherewithal, or ability to go into further detail. Therefore we suggest that you move on to the appropriate chapters in this book, and take a look at the references listed below.

Where do I go from here?
As you can see, correlational research is quite a bit more involved than action research or using surveys. However, it is a very useful tool in analyzing relationships between different variables, and you should seriously consider making it a part of your research arsenal.

Experimental Research

What is it?
Experimental research is the oldest and most difficult type of research, and that is why we are not going to spend a lot of time confusing you about it here. Up to now, we have shown you that action research helps to solve everyday problems in everyday classrooms; surveys help you to discern patterns of responses; and correlational research helps you to discover relationships. Experimental research is for those times when "you have really got to know!"

You may wonder if three hours per week of listening will improve students' scores, as compared to the one hour per week you are teaching now. One may also ask if the amount of reading a student does has much effect on the student's ability to spell. Does the amount of time a student uses the Internet relate to the student's reading ability? In all of these cases, we are trying to see if there is some kind of cause-and-effect relationship between two variables which are well defined and easily measurable. To assess that relationship, the only thing to do, then, is to set up an experiment that isolates the two variables, get some data, and see how the data compare.

When do I do it?
Although the research purist may cringe, the ideal time for the average classroom teacher to set up and run an experimental study is . . . never. It is our belief that the true heavyweight research should be undertaken by trained professionals. Because of the difficulty and expense of doing a proper experimental study, most teachers would be much better served by action research or some sort of survey study. That is not to say that teachers are incapable of doing statistical research—we are just trying to be realists.

Having said that, we must now state that there is never a better time to get involved in hard experimental research than today! Teachers need to know where the researchers are coming from, and what better way to find out than by doing it

ourselves. One reason for the growing popularity of action research is that the teacher is a central player. His or her problems, concerns, or questions are being directly addressed. Experimental research can do the same, but only if the teacher gets involved. Indeed, some researchers have argued for greater involvement in research by everyday teachers (see Nunan, 1991; Johnson & Chen, 1992).

How do I set it up?

For now, the best way for teachers to get a general understanding of experimental research is to extend our earlier imaginary example. Recall that in the correlational study, the distinguished professor investigated the relationship between students' beer drinking during the break and participation after the break. Let us suppose that the professor found a strong positive correlation; in other words, the students who drank beer(s) during the break actually did participate more in the second half of the lecture. This led the professor to wonder if the beer really was responsible for the increased performance, or whether another unknown factor was at work.

First the professor randomly separated the class into two groups. One group, called the control group, would receive no special treatment. The second group became the experimental group, which would receive a measured amount of beer. The first half of the following lecture was held as normal, and a participation score was calculated for each "subject." Then, during the break, all of the students were herded into a different room where the "treatment" was given. The control group received nonalcoholic beer during the 15-minute break, but the experimental group received a predetermined amount of genuine beer. After the break, the class resumed as usual, and again the amount of participation for each student was recorded.

How do I analyze the results?

As we mentioned above, the goal in a typical experimental study is to determine whether a group that receives a treatment, such as a new way of teaching (or a controlled amount of alcohol), performs differently from a group that receives no special treatment. Unfortunately, an explanation of the statistics needed to analyze the data from an experimental study properly is beyond the scope of this chapter.

Where do I go from here?

If you are truly interested in experimental research, we urge you to pick up a couple of good books, such as the ones listed below or the ones mentioned elsewhere (see Griffee, this volume). Once you understand the concepts involved, get a grasp on the types of analyses necessary to do justice to your data, and come up with clear and precise research questions and hypotheses, you will be on your way. The time it takes to reach that point may be more time than most teachers are willing to invest, however.

One way to begin to get a grasp on experimental research is to have a look at Brown (1991) and Brown (1992). These articles try to help teachers understand

statistical research. They are not "how to do" articles, but more along the lines of "how to read and understand." Along with Brown's 1988 book, *Understanding Research in Second Language Learning*, they are essential reading for any teacher who has shied away from reading or carrying out experimental research.

Conclusion

We have attempted to introduce several types of research that may be of interest to teachers who, until now, have proclaimed a severe allergy to research. Although we have made light of research in this paper, we do not mean to imply that it is something that should be taken lightly. Every professional teacher needs to, at the very least, make an effort to understand research that is relevant to his or her teaching situation. We would also like to suggest that every teacher would be well served by trying out some type of research in his or her own classroom. Your goal does not have to be publication of a refereed article in a leading journal. Indeed your goal does not even have to be to write any article at all. But, all teachers should feel the need to improve themselves, and that is what classroom research is all about.

So, next time you have some trouble in your class, or next time a lesson bombs, or you are faced with students who do not seem to respond, or you hear about a great new lesson and wonder if it could work in your classes, stop wondering. Get out there and do something about it. Research may be the answer.

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